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<div>Division of Forensic Science</div> <div>TRACE EVIDENCE PROCEDURES MANUAL</div>	Amendment Designator:
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<div>4 CHEMICALS AND REAGENTS</div> <p>A. All chemicals and commercial reagents are labeled when received with the date received and the initials of the individual receiving them, and again when opened. All chemicals and commercial reagents are placed onto an inventory list maintained either within the section or within the laboratory. All chemicals and commercial reagents are replaced when their stated shelf life has expired <u>or</u> when they fail to perform adequately under controlled conditions.</p> <p>B. The purity of extraction solvents, such as pentane or carbon disulfide, is critical. As a check, an appropriate amount of solvent from each lot is concentrated by evaporation and analyzed by gas chromatography. The resulting data is maintained in an appropriate location within the section.</p> <p>C. All laboratory prepared reagents will be clearly labeled to reflect the reagent name, date prepared and preparer's initials. Any working bottles of reagent aliquoted from a stock bottle will be labeled in a similar manner. The log sheets in this section will specify the information that must be captured for each reagent. This will include the quality check to ensure that the reagent is functioning properly. A stock bottle of reagent may continue to be used until the aliquoted reagent fails the quality check. If this occurs, it is the examiner's responsibility to immediately dispose of the remaining reagent and to communicate this to all examiners with working bottles of the reagent. After the initial preparation, reagents will be checked at least once per each case analyzed. The results of the QC check are recorded in the case notes. (A notation such as "QC \checkmark +" is sufficient to document the reagent reacted as expected.)</p> <p>D. All other reagents used in non-routine examinations, such as general chemical type cases, are prepared as necessary and are tested with knowns and blanks, the results of which are recorded in the case file notes.</p> <p>E. Test strips are checked with appropriate standards and results are recorded in case notes. Test strips may continue to be used past their stated expiration date as long as the QC check is positive.</p> <p>F. Reagent Recipes for Routine Examinations</p> <p>Aqueous Aniline Sulfate: Dissolve 5.0 g aniline sulfate in 100 ml deionized water. (Ref. 2)</p> <p>Barium Chloride: Dissolve 5.0 g barium chloride in 100 ml deionized water (5% solution). (Ref.1)</p> <p>Brucine: Dissolve 5.0 g brucine sulfate in 100 ml concentrated sulfuric acid. (Ref. 1)</p> <p>Diphenylamine: Dissolve 0.68 g diphenylamine in 45 ml concentrated sulfuric acid. Place in ice bath and cautiously add 22.5 ml glacial acetic acid. (Ref. 6)</p> <p>Hydrochloric Acid (15%): Mix 7.9 ml concentrated HCl into 12.1 ml deionized water. (Ref. 7)</p> <p>LeRosen: Mix 75 ml of concentrated sulfuric acid in 1.5 ml of 37% formaldehyde. (Ref. 3, pp.137)</p> <p>1-Naphthol: Dissolve 15 g 1-naphthol in 100 ml of ethanol (Ref. 2)</p> <p>Nessler: Dissolve 20 g potassium hydroxide in 50 ml deionized water. Dissolve 10 g mercuric iodide and 5 g potassium iodide in 50 ml deionized water. Mix together. (Ref. 4)</p> <p>Silver Nitrate: Dissolve 3.75 g silver nitrate in 75 ml deionized water. (Ref. 1)</p> <p>Sodium Hydroxide: <u>2.0 N</u>: Dissolve 6.0 g NaOH in 75 ml deionized water. (Ref. 4, pp. 57, 64) <u>Saturated</u>: Dissolve 10g NaOH in 100 ml deionized water (Ref. 2)</p> <p>Sulfuric Acid (75%): Mix 56.25 ml concentrated sulfuric acid into 18.75 ml deionized water. (Ref. 7)</p> <p>Triphenyl Selenium Chloride: Saturated solution in 60 ml deionized water. (Ref. 5)</p>	

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<p>G. Reagent Recipes for Non-Routine Examinations</p> <p>Fehling's: Dissolve 7.5 g copper sulfate in 100 ml deionized water. Dissolve 35 g sodium tartrate and 25 g potassium hydroxide in 100 ml deionized water. Mix equal volumes of each solution. (Ref. 3, pp.131)</p> <p>Nitron: Dissolve 3.75 g nitron (diphenylenedianilohydrotriazole) in 75 ml of 88% formic acid.(Ref. 1)</p> <p>Triphenyltetrazolium Chloride: Dissolve 0.38 g triphenyltetrazolium chloride in 75 ml deionized water. (Ref. 3, pp. 338)</p> <p>H. References</p> <ol style="list-style-type: none"> Parker, R.G., Stephenson, M.O., McOwen, J.M, Cherolis, J.A., “Analysis of Explosives and Explosive Residues. Part 1: Chemical Tests”, Journal of Forensic Sciences, 1975, 20, 1, pp. 133-140. “Spot Tests, Systematic Analysis Of Low Explosives”, Bureau of Alcohol, Tobacco, and Firearms, Rev 6/88. Feigl, F. “Spot Tests In Organic Analysis” 7th Ed, 1966. Jungreis, Ervin.; “Spot Test Analysis, Clinical, Environmental, Forensic, and Geochemical Applications”, Volume 75, 1985, pp.57-58. Anger, V., and Feigl, F., <u>Spot Tests in Inorganic Analysis</u>, 6th ed., Elsevier Publishing Company: Amsterdam, The Netherlands, 1972, p.184. Thornton, John I., “Forensic Paint Examination,” Forensic Science Handbook, Volume 1, Prentice-Hall, Inc., 1982, p.550. Hall, David.; “Practical Fiber Identification”; Textile Engineering Department, Auburn University., 1976; p.36. <p>I. Reagent Log Sheets (see following pages)</p> <p style="text-align: right;">◆End</p>	

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REAGENTS LOG SHEET	
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BRUCINE

Dissolve 5.0 g brucine sulfate in 100 ml concentrated sulfuric acid.

Check against potassium nitrate. Positive is an orange to yellow color.

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REAGENTS LOG SHEET

FEHLING'S

Dissolve 7.5 g copper sulfate in 100 ml deionized water. Dissolve 35 g sodium tartrate and 25 g potassium hydroxide in 100 ml deionized water. Mix equal volumes of each solution.

Check against known lactose and sucrose. Positive is a yellow/orange/red precipitate.

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REAGENTS LOG SHEET	
NITRON	
Dissolve 3.75 g nitron (diphenylenedianilohydrotriazole) in 75 ml of 88% formic acid.	
Check against potassium nitrate. Positive is the formation of a white precipitate, often in the form of needles.	

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REAGENTS LOG SHEET

TRIPHENYLSelenium CHLORIDE

Saturated Solution in 60 ml deionized water.

Check against potassium perchlorate. Positive is the formation of a white precipitate.

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